

GLANDULICACTUS UNCINATUS VAR. WRIGHTII (CACTACEAE)
WITH 15 CM SPINES

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ABSTRACT

Central spines of *Glandulicactus uncinatus* var. *wrightii* have never been reported longer than 13 cm. I report plants from Anthony's Nose in far West Texas with 15–16.5 cm central spines.

RESUMEN

Las espinas centrales de *Glandulicactus uncinatus* var. *wrightii* nunca se han reportado mayores de 13 cm. Estoy reportando plantas de Anthony's Nose en el lejano oeste de Texas con espinas centrales de 15–16.5 cm.

INTRODUCTION

Glandulicactus uncinatus (Galeotti ex Pfeiff.) Backeb. var. *wrightii* (Engelm.) Backeb. is renowned for its single long hooked central spine per areole, which is always straw colored, except at the hooked tip where it is red-dish-brown. Maximum spine length has been reported as anywhere from 9–13 cm (Table 1).

This short note documents that central spines can grow to at least 15 cm and possibly 16.5 cm long in this taxon, where I estimated spine lengths *post hoc* from photos with an object of known size for scale.

Near the northern edge of its range at Anthony's Nose and North Anthony's Nose in El Paso County, Texas, and Doña Ana County, New Mexico, there are several specimens of *Glandulicactus uncinatus* var. *wrightii* with central spines that appear to be around 15 cm long. Figures 1 and 2 are of a plant with central spines to at least 15 cm long, growing 100–200 m south of the New Mexico state line, along the main trail in Franklin Mountains State Park, Texas, that forms the continuation of New Mexico's Sierra Vista Trail. These are the longest central spines I have seen in this taxon, although spines are probably just as long on several plants here, as well as near Mule Ears Peak in Big Bend National Park, Texas.

METHODS

I did not have the foresight to measure spine lengths in the field in February 2020 and cannot return due to the Covid pandemic, hence need to describe how I estimated spine length from photos, using a tape measure held up to a computer screen.

One photo of *Glandulicactus uncinatus* var. *wrightii* at Anthony's Nose included a 7.2 cm diameter lens cap for scale, but the longest spine is truncated on this photo (Fig. 1). In that image, I measured the lens cap diameter parallel to the ground, i.e., with a horizontal line segment because the lens cap was slightly tilted vertically and because the bottom of the lens cap was truncated in the image. I used that photo to estimate the length of the next longest spine (untruncated, just reaching the top of Fig. 1) growing from near the top of the plant body on the two-dimensional image. I used another photo of the same plant taken from slightly farther away, but from the same direction (Fig. 2), to estimate the length of the longest spine, again with estimates based on two-dimensional images. In each instance, I measured spine length as the longest straight line from the base of the spine to the top of the hook at the distal end of the spine, i.e., these measurements do not account for curvature of spines, which can be extreme in some plants (Fig. 3), but not on the specimen in Figures 1 and 2.

TABLE 1. Maximum reported spine length (cm) of *Glandulicactus uncinatus* var. *wrightii*.

cm	source
9	Backeberg (1977); Loflin & Loflin (2009)
10	Engelmann (1856); Weniger (1969); Heil & Spellenberg (1993); Powell & Weedon (2004)
11	Weniger (1984)
12	Britton & Rose (1922); Schultz & Runyon (1930)
13	Anderson (2001); Zimmerman & Parfitt (2003); Bowers et al. (2009)



FIG. 1. *Glandulicactus uncinatus* var. *wrightii* (near center of the photo, with lens cap) with 15.0–16.5 cm central spine. Anthony's Nose, Franklin Mountains State Park, Texas, 100–200 m from New Mexico state line, with *Coryphantha sneedii* (Britton & Rose) A. Berger on the left (28 Feb 2020). Lens cap is 7.2 cm diameter.

Two-dimensional estimates of spine length are overestimates because the one object for which we know the length, the lens cap, is in the foreground of a fairly close-up image. To compensate for foreshortening (parallax) of the spine length and height of the plant body, I used geometry of similar triangles, where reduction in size of the plant parts is proportional to the ratio of (1) distance from the center of the plant body to the lens cap (“*lens cap*”) divided by (2) distance from the center of the plant body to the camera (“*camera*”). Estimates of actual length of the spines and plant body in three-dimensions are the two-dimensional estimates multiplied by a reduction factor of $(1 - \frac{\text{lens cap}}{\text{camera}})$. I provide both the maximum and minimum values for this reduction factor by estimating the range of values for *lens cap* (2–5 cm) and *camera* (35–55 cm) based on my taking of the image in Figure 1.

Per suggestion of reviewer Rolando Tenoch Bárcenas, I used the above methodology with the same camera, lens, and lens cap to estimate length of the longest spine and longest shoot on 10 plants in my cold-hardy cactus garden in Central Ontario, Canada, then afterwards directly measured those shoots and spines. My



FIG. 2. Same plants as Figure 1.



FIG. 3. *Glandulicactus uncinatus* var. *wrightii* with long central spines whose lengths are hard to measure because of a gentle 90° turn halfway along the length of each spine, so that the base of each spine is oriented vertically whereas the distal end is oriented horizontally. SW edge of North Anthony's Nose, ca. 200 m N of NM Highway 404; at or near the southern boundary of Organ Mountains–Desert Peaks National Monument (11 Mar 2020).

TABLE 2. Estimated length (cm) of parts of plant in Figures 1 and 2, with two-dimensional (2D) measurements taken directly from photos and three-dimensional (3D) estimates based on geometry.

	2D	3D
Longest spine	17.3	14.9–16.6
Next longest spine	14.7	12.6–14.1
Plant body	10.9	9.4–10.5

estimates were always within 6% of the actual lengths, with most estimates less than or equal to the actual lengths, i.e. underestimates. These 10 specimens were in roughly the same size range as the *Glandulicactus wrightii* var. *uncinatus* in Figures 1 and 2, with the longest shoots and spines of the 10 garden plants, none of which were *Glandulicactus*, being 31 cm and 8 cm, respectively.

RESULTS

Lengths of the longest spine and next longest spine at the top of the plant, as well as height of the plant body, are given in Table 2. Two-dimensional estimates are read directly off of Figures 1 and 2, using the 7.2-cm lens cap as reference. Three-dimensional estimates account for foreshortening (parallax), where a range is provided because I did not precisely know the distance from the center of the plant body to either the lens cap or the camera. Rounding the three-dimensional estimates to the nearest half centimeter, the longest spine at the top of the plant is 15.0–16.5 cm long.

My gestalt in the field, as recorded in my notes later that day, was that the longest spine on this plant was 15.2–17.8 cm (6–7 inches), which is consistent with the above estimate of 15.0–16.5 cm. These estimates are also consistent with my gestalt estimate in field of the stem being 10.2–12.7 cm (4–5 inch) tall compared with my calculated estimate of 9.4–10.5 cm. This plant had a large, but not huge, stem, which is also consistent with the *Flora of North America*’s description of stems being 7–15(–30) cm tall (Zimmerman & Parfitt 2003).

DISCUSSION

Central spine length at both Anthony’s Nose and North Anthony’s Nose, i.e. , on either side of Anthony Gap, are variable between plants, but relatively constant within a given plant once stems grow to about 3–4 cm tall, at which time full length spines and flowers start appearing (personal observation). Near Anthony Gap, length of the hooked central spine on mature plants of *Glandulicactus uncinatus* var. *wrightii* varied between 5–15 cm, with several plants having spines almost as long as the ones pictured herein.

Maximum length of central spines of *Glandulicactus uncinatus* var. *wrightii* should be listed as 15 cm or 16.5 cm, which is either 15% or 27% longer than previously reported. The type locality for *G. uncinatus* var. *wrightii* is “Near El Paso and on the Rio Grande below” (Engelmann 1856: 272), which is ca. 25 km south of Anthony Gap. Maximum length of central spines for this variety has only previously been reported to 13 cm, but this could be due to lack of herbarium specimens of *G. uncinatus* var. *wrightii*. SEINet (<https://swbiodiversity.org/>), which has the most comprehensive online compilation of herbarium records from New Mexico, Arizona, and West Texas, only contains 13 herbarium specimens of this taxon.

ACKNOWLEDGMENTS

Many thanks to the reviewers, Rolando Tenoch Bárcenas and A. Michael Powell.

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